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Bilge

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(54) **SYSTEM FOR MOUNTING WALL PANELS TO A WALL STRUCTURE**

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Related U.S. Application Data

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(51) **Int. Cl.**
E04F 13/07 (2006.01)
E04B 2/18 (2006.01)

(52) **U.S. Cl.** **52/235**; 52/506.05

(58) **Field of Classification Search** 52/235, 52/506.05, 509–512, 656.9, 463, 468, 177, 52/489.1, 483.1
See application file for complete search history.

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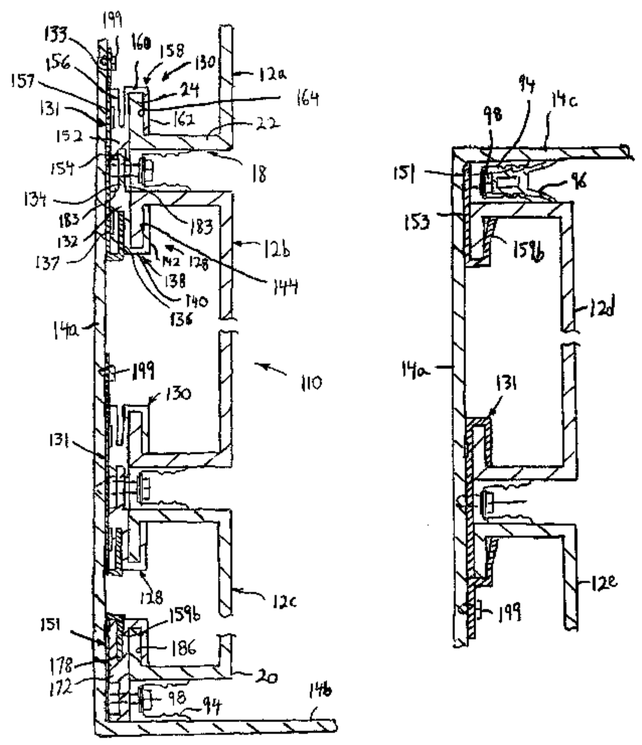
(57) **ABSTRACT**

A system for mounting wall panels to an existing wall structure, includes a plurality of wall panels, each wall panel having a main panel section and hook walls at edges of the main panel section, with the main panel section and each hook wall having a U-shaped cross-sectional profile. There are also a plurality of fastening extrusions, each fastening extrusion including a securing section for securing the fastening extrusion to the existing wall structure, a first retaining wall structure near one end of the fastening extrusion and adjacent the securing section, the first retaining wall structure including a recess which receives one hook wall of the wall panel, and a second retaining wall structure near another end of the fastening extrusion, the second retaining wall structure including a recess which receives one hook wall of another wall panel.

17 Claims, 14 Drawing Sheets



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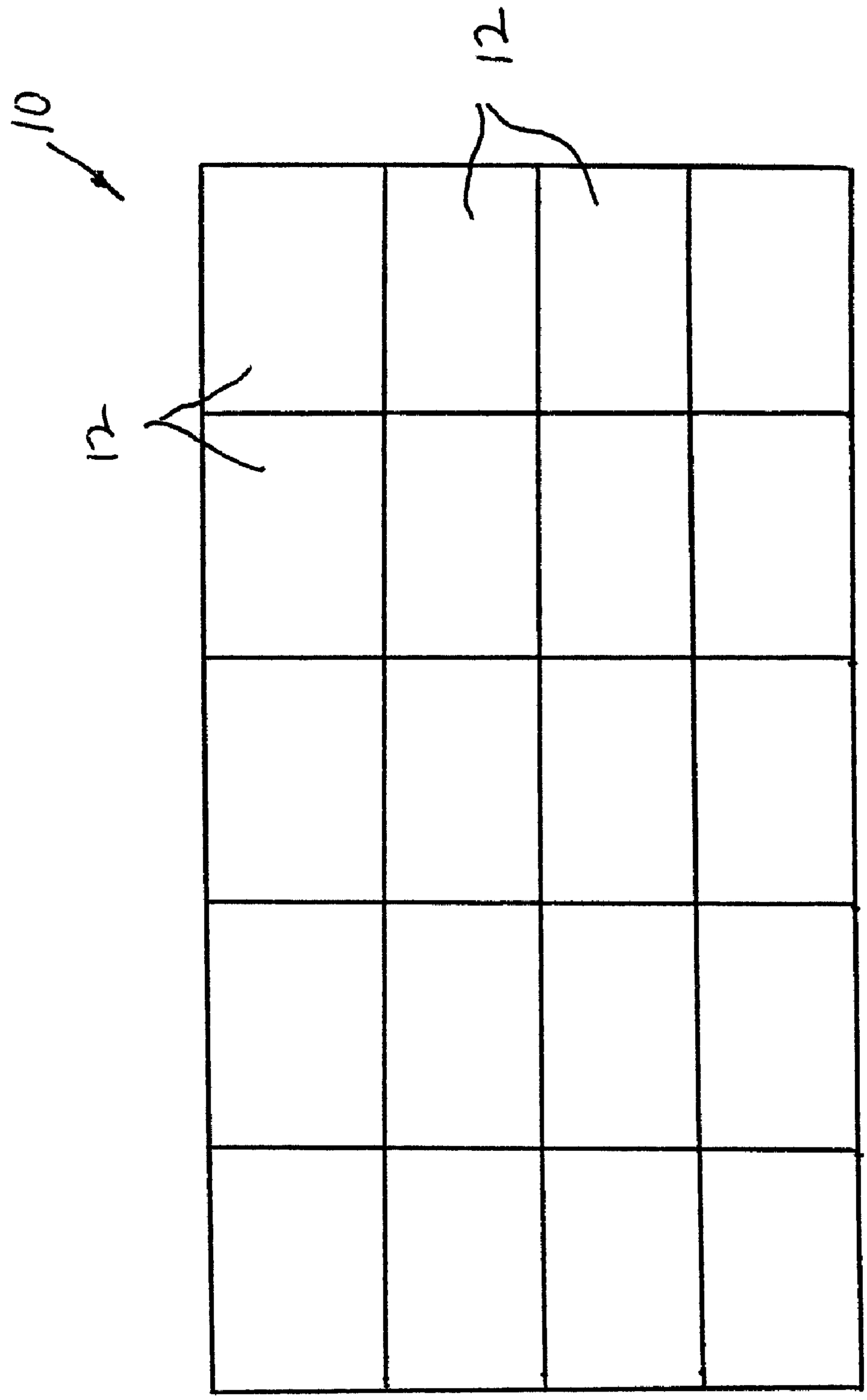

FIG. 1

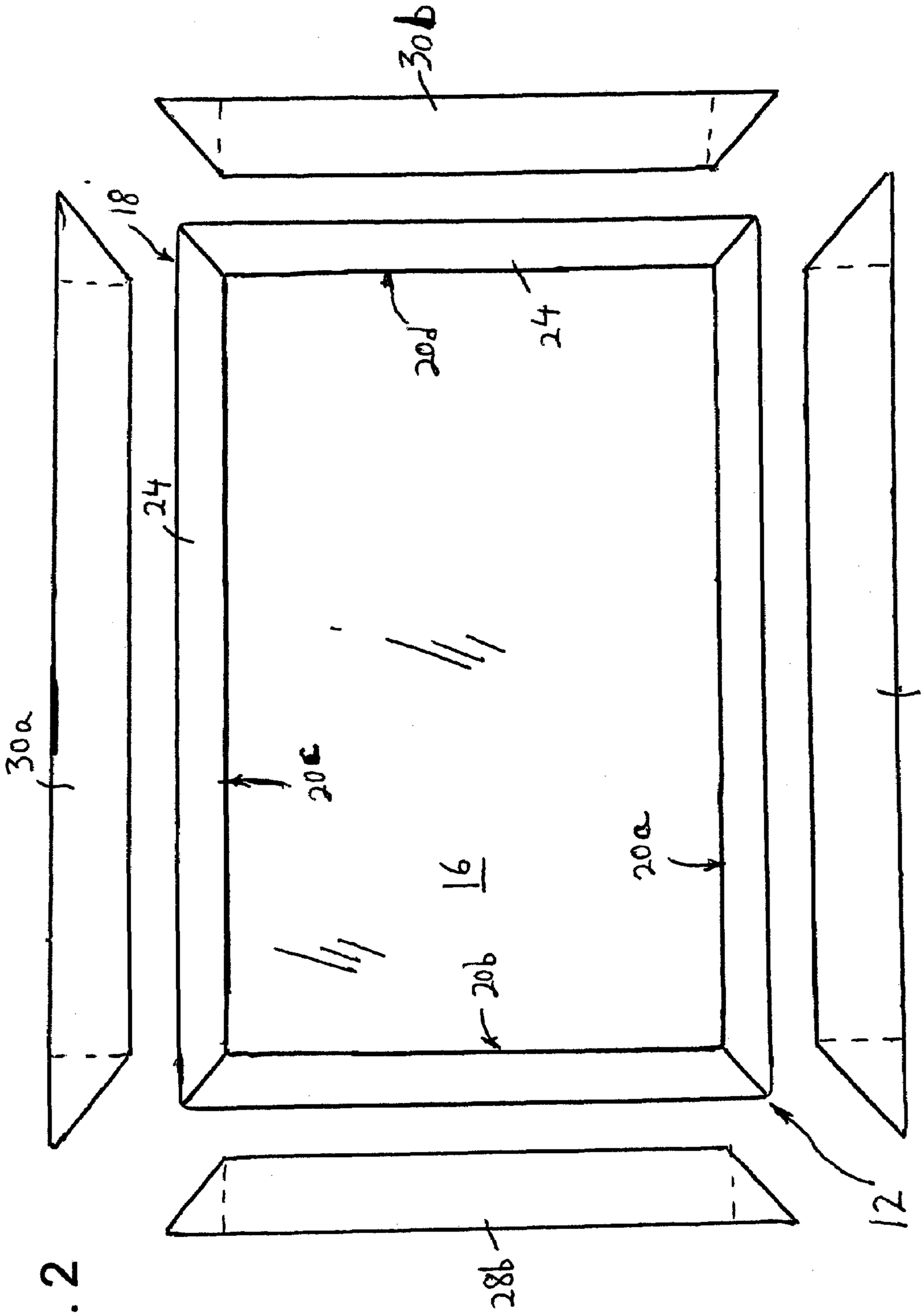

FIG. 2

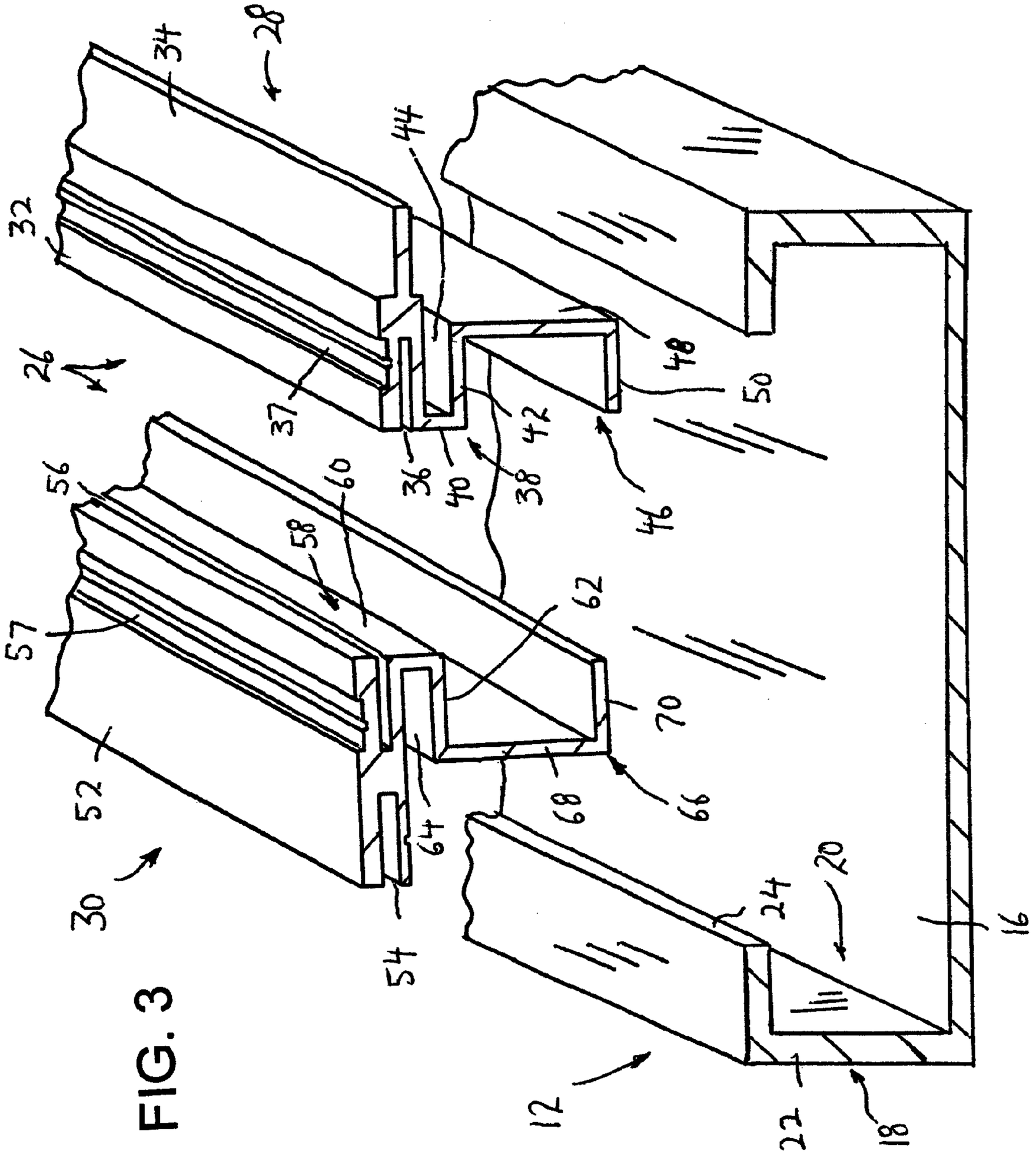
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FIG. 3

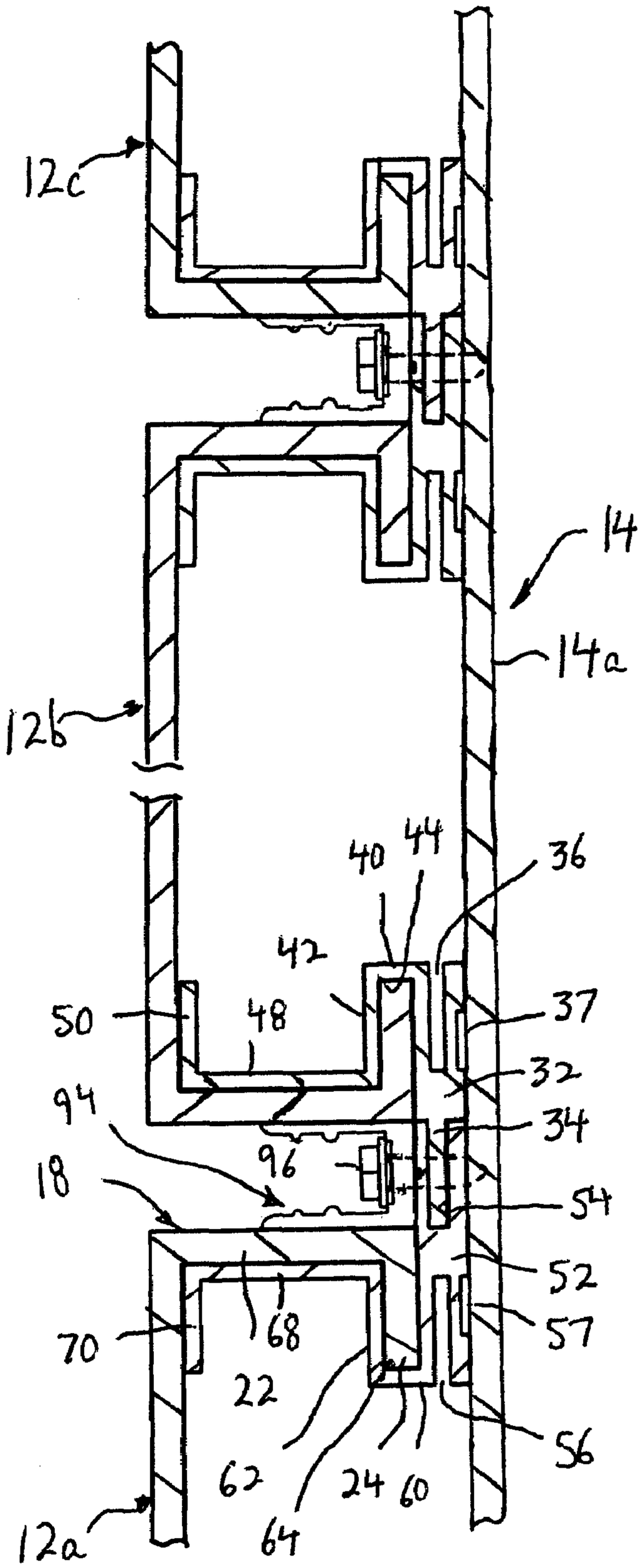
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FIG. 4

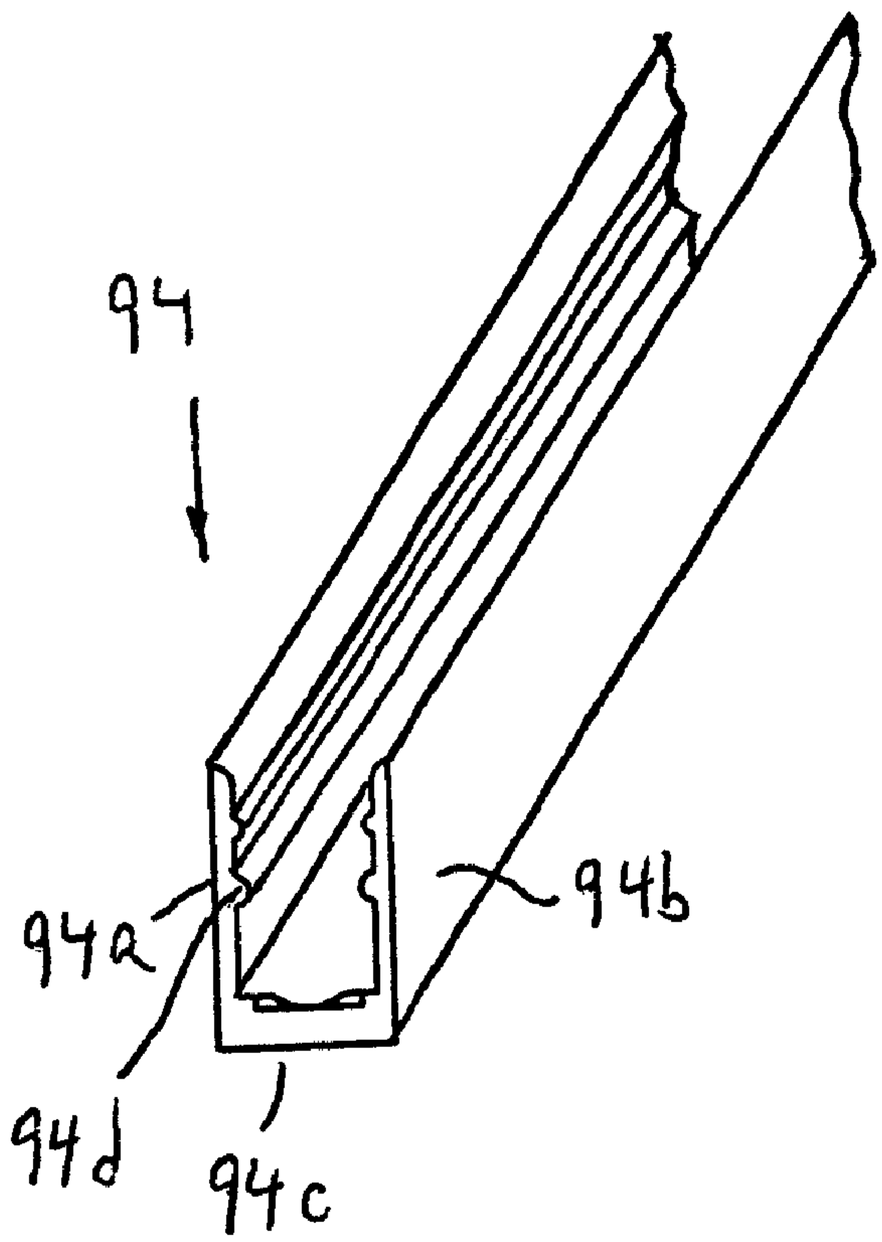

FIG. 5

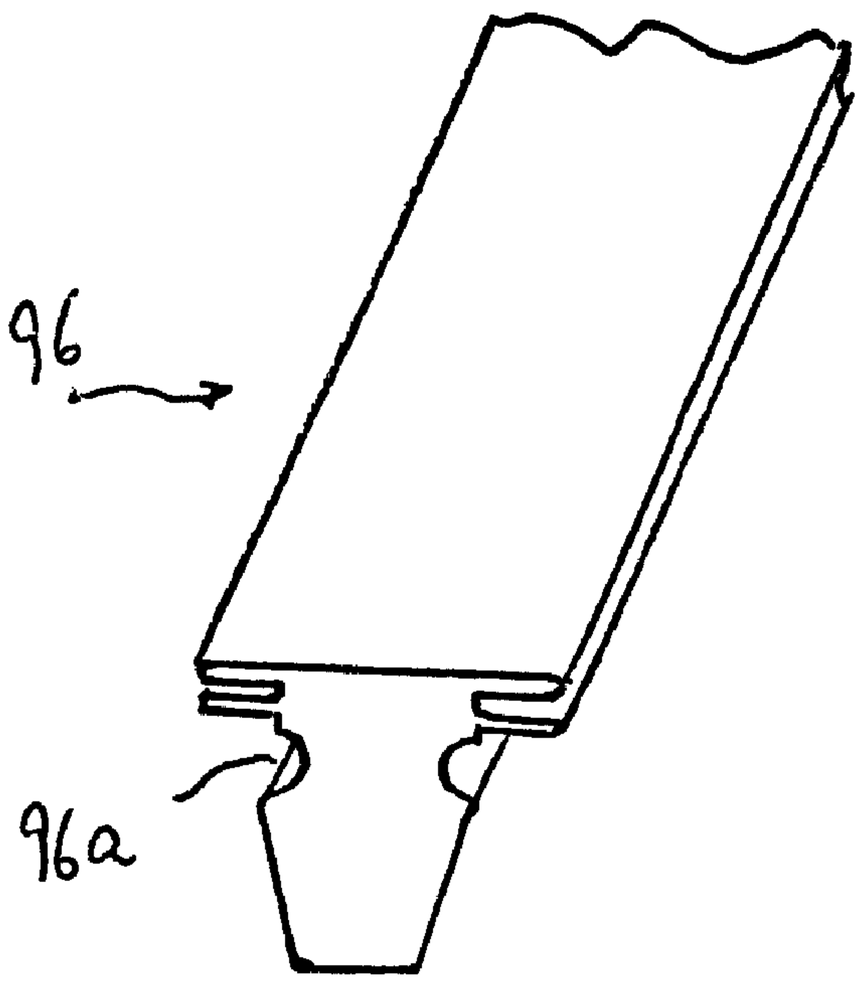

FIG. 6

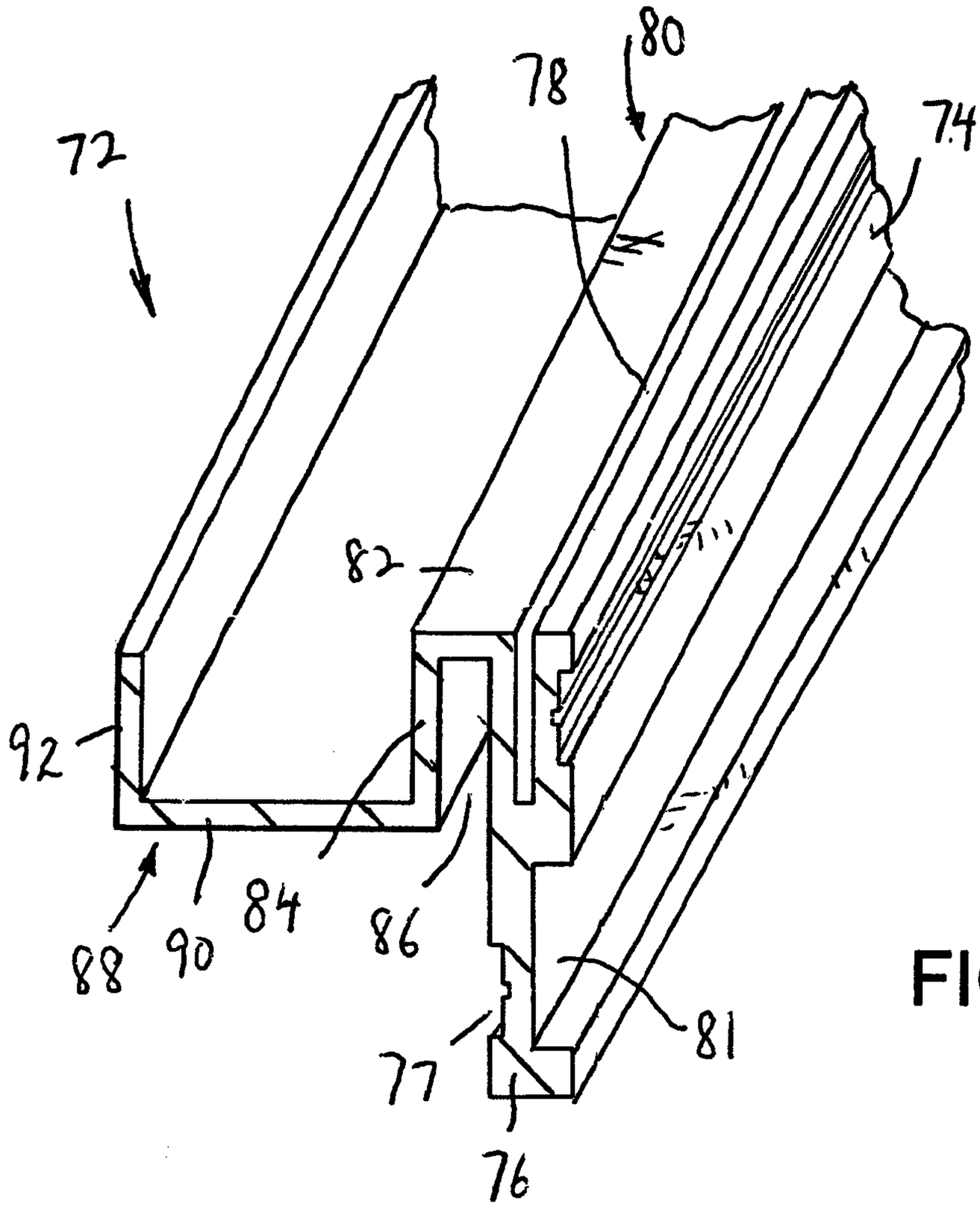
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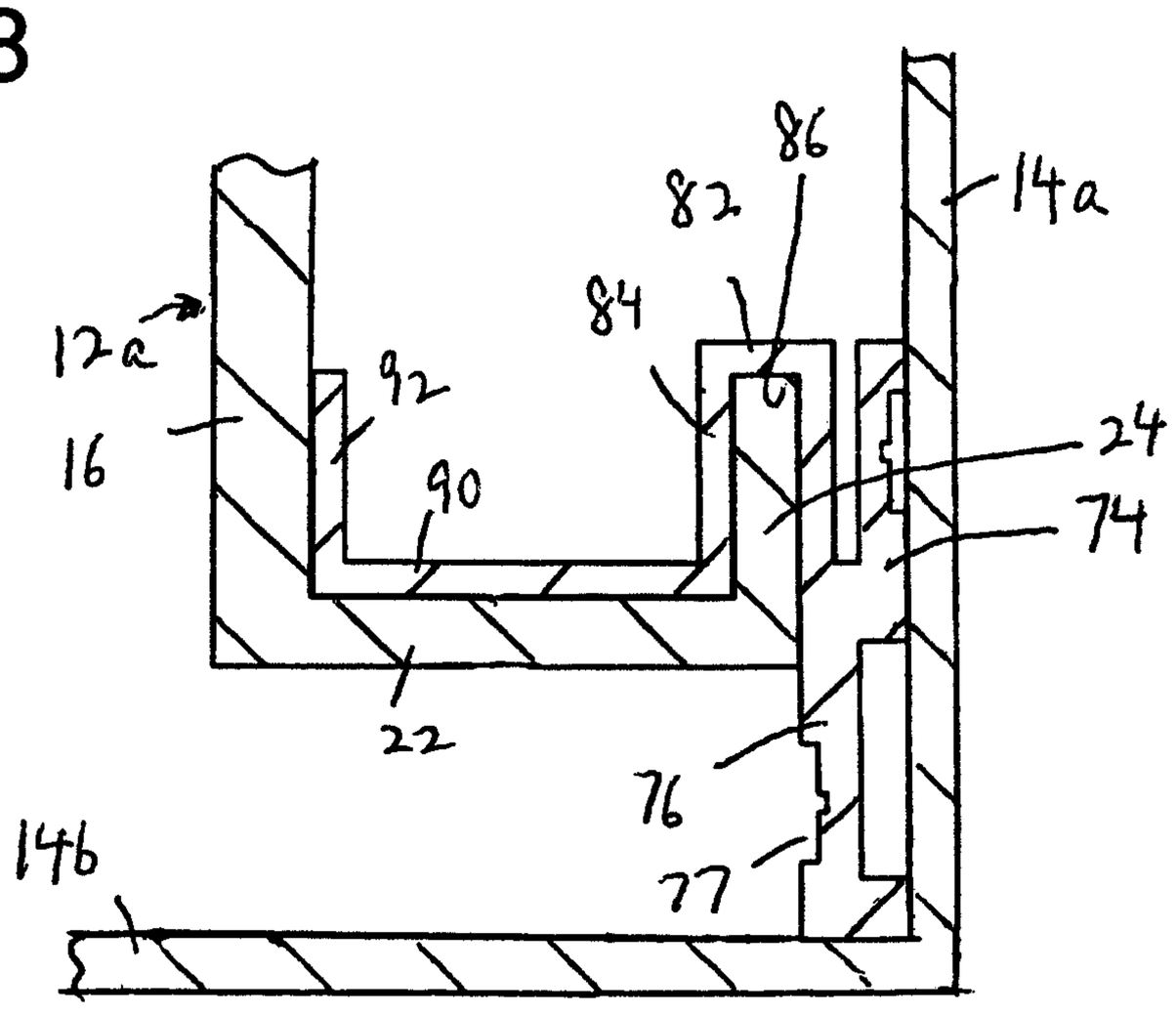
FIG. 7

FIG. 8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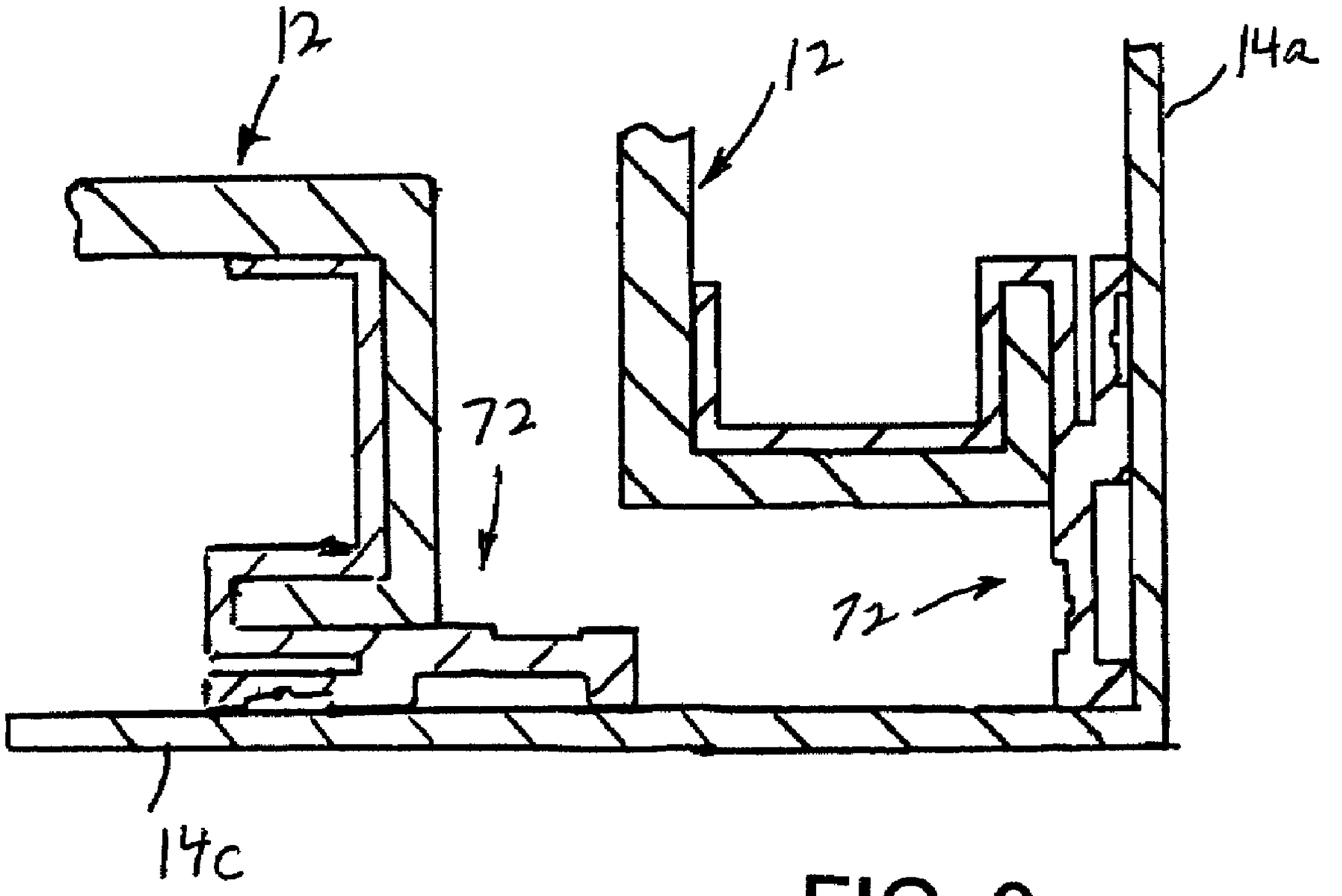


FIG. 9

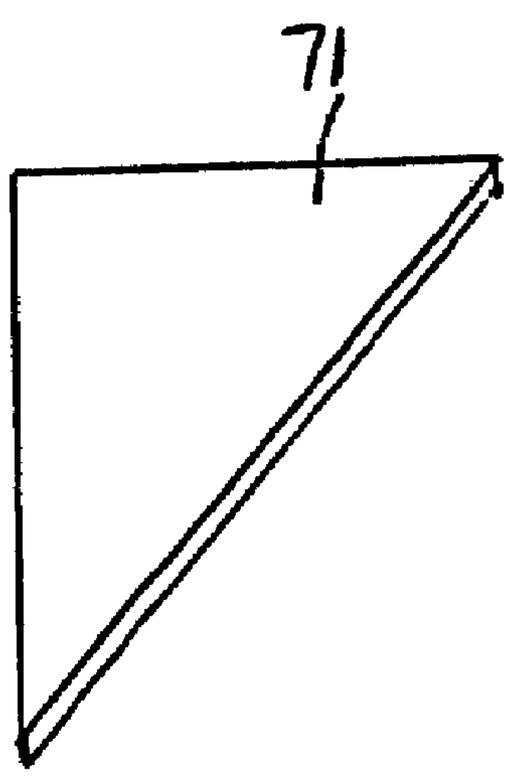
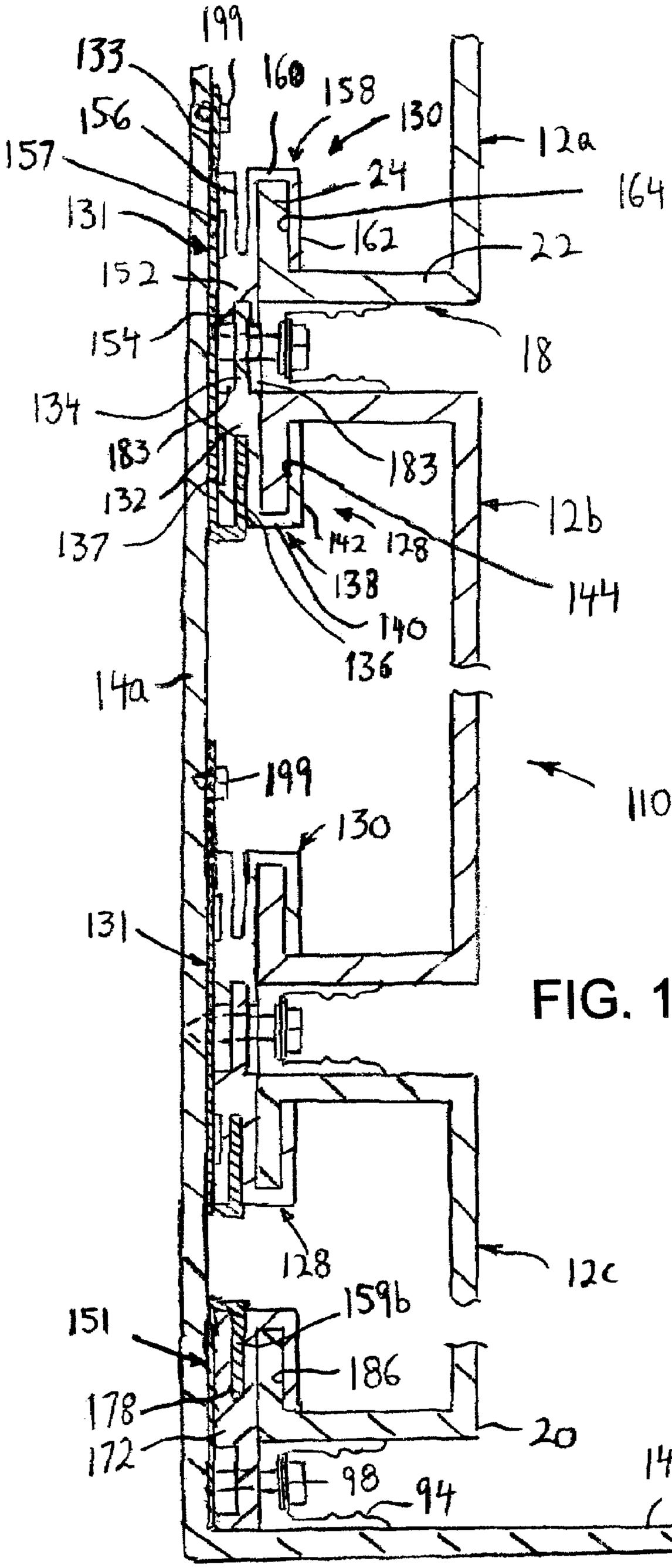


FIG. 10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142
128
138
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172
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FIG. 11

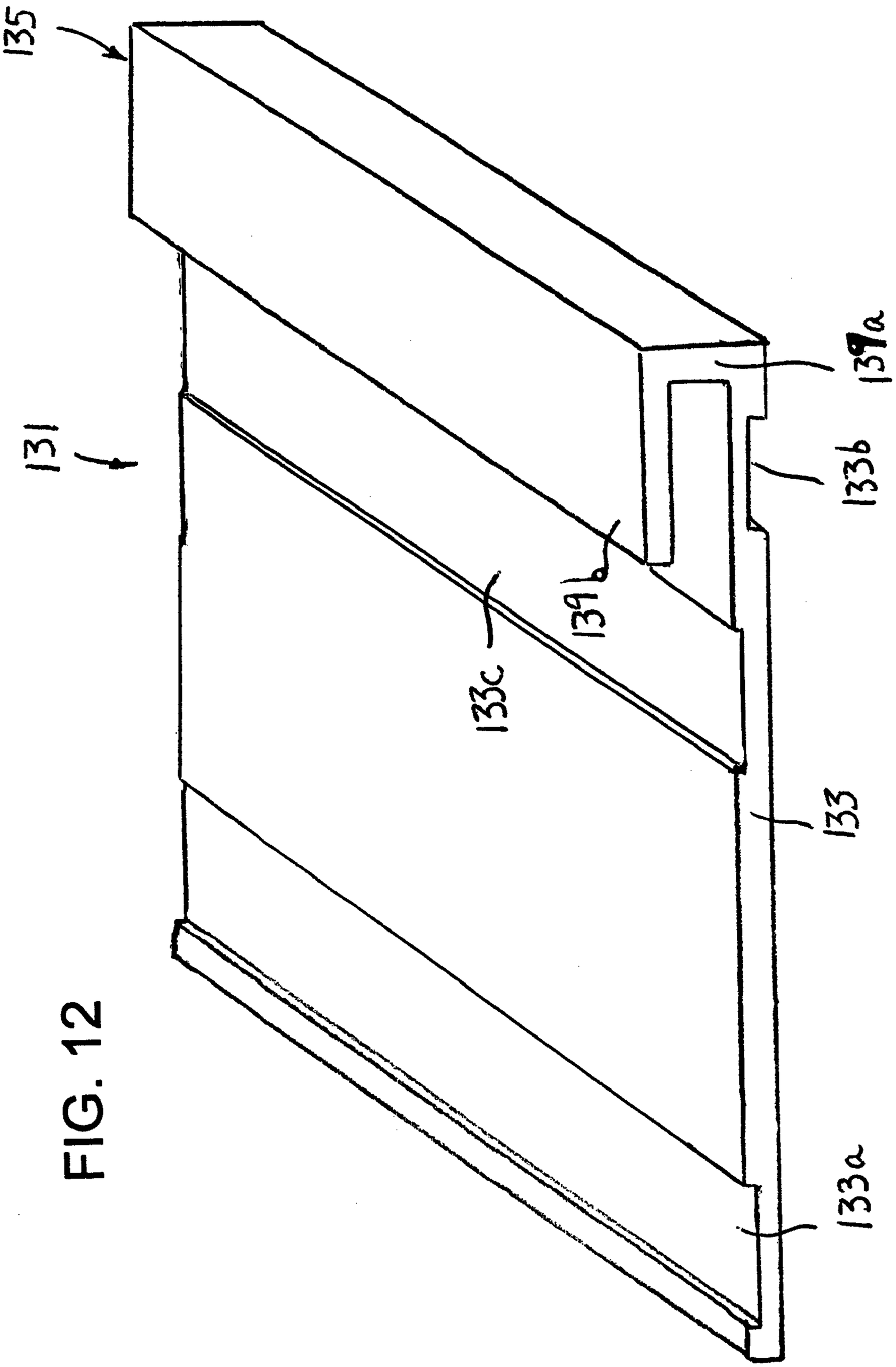


FIG. 12

FIG. 13

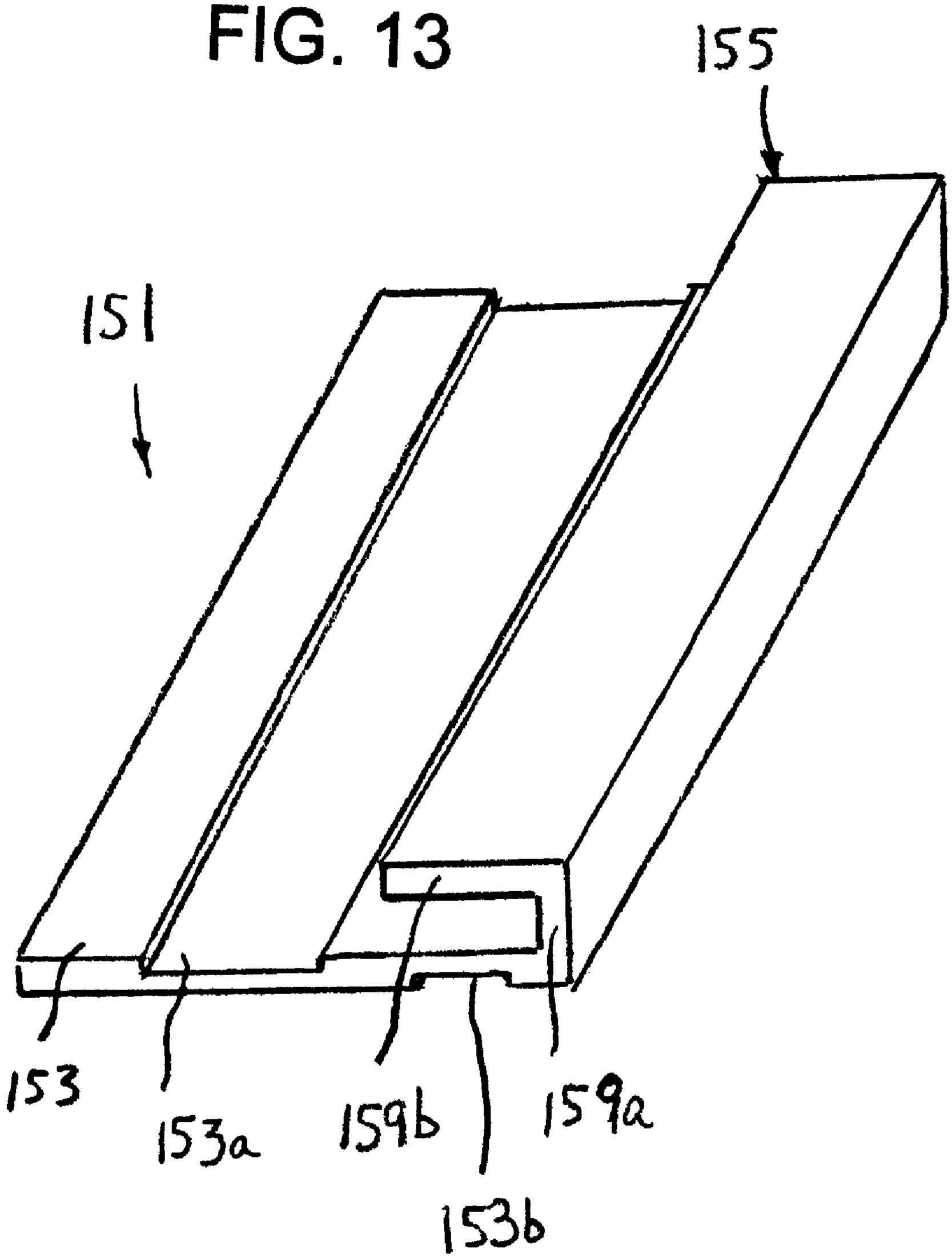
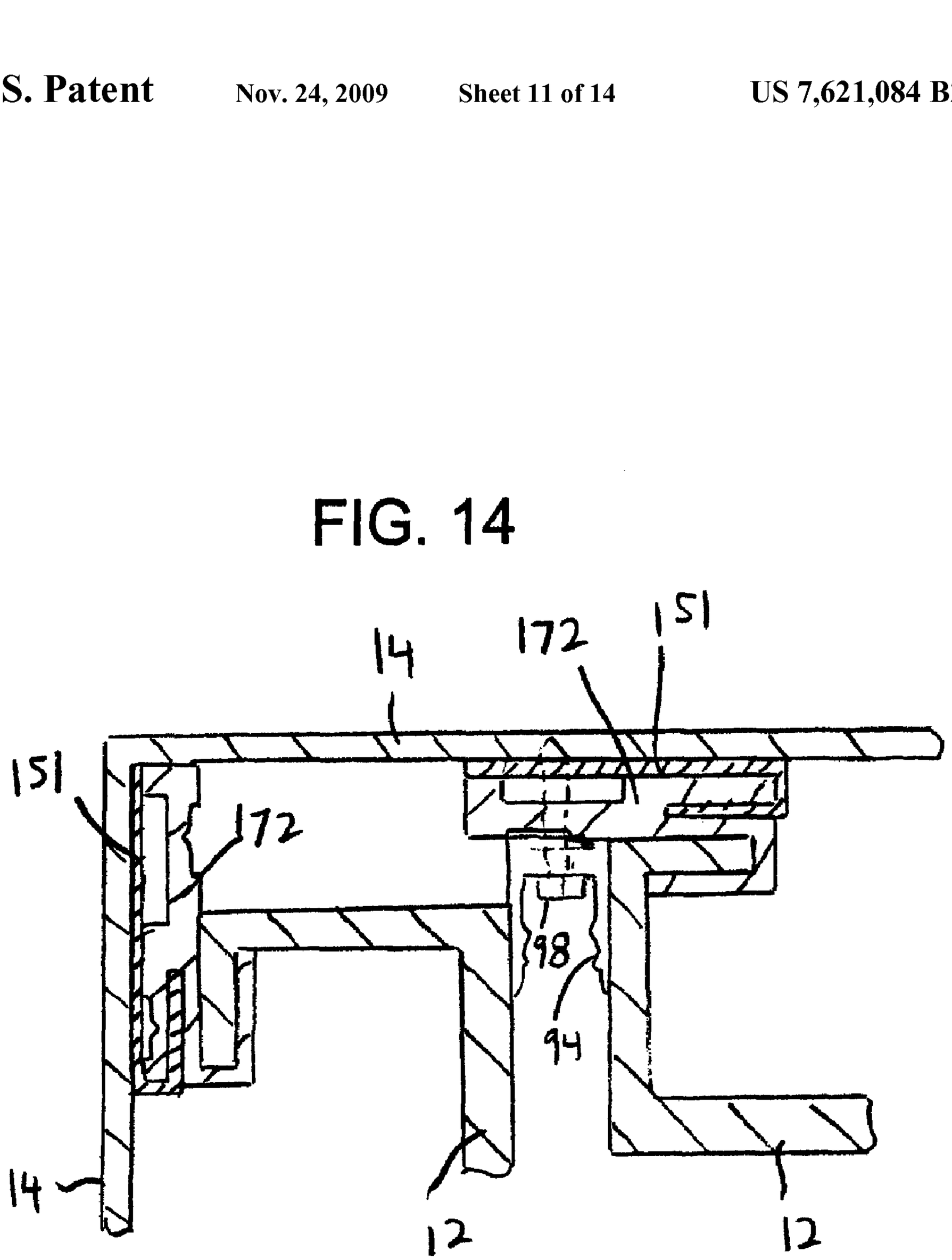


FIG. 14



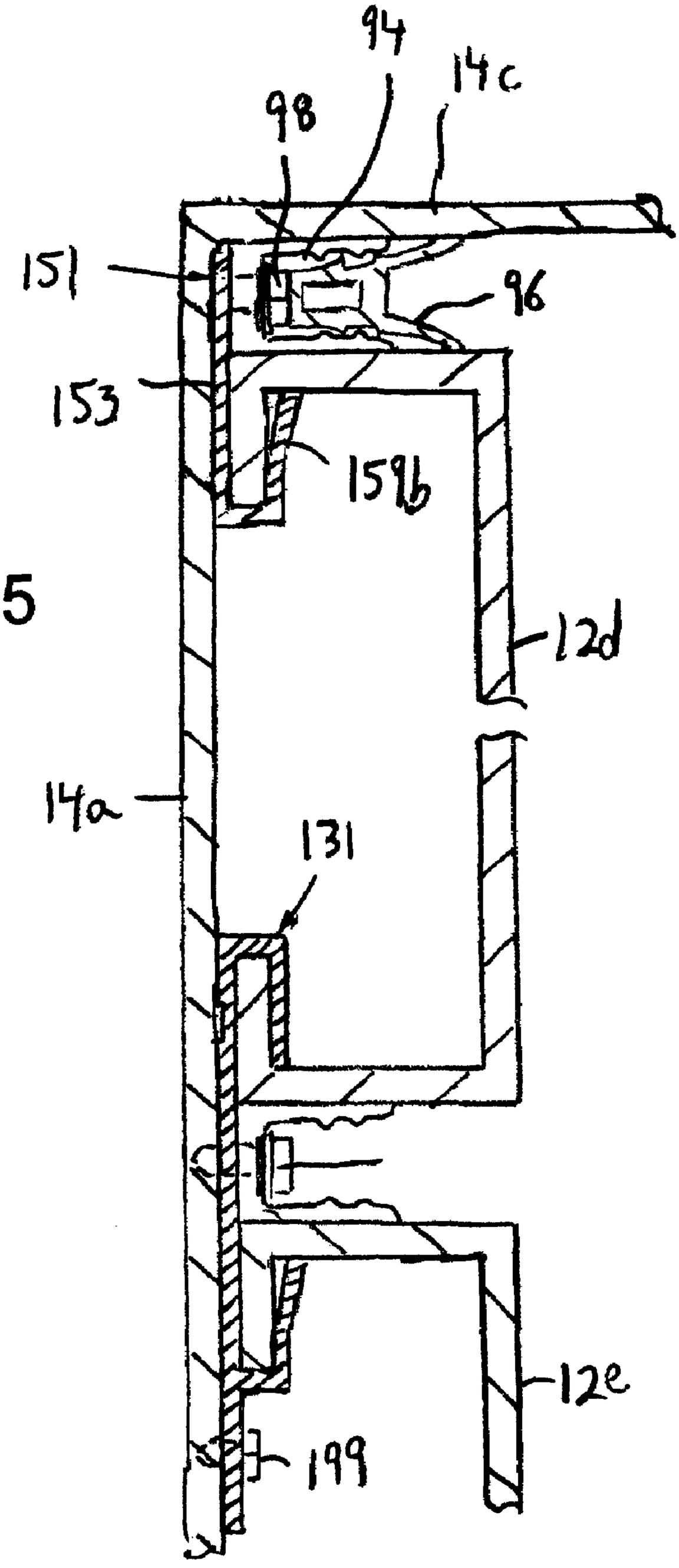


FIG. 15

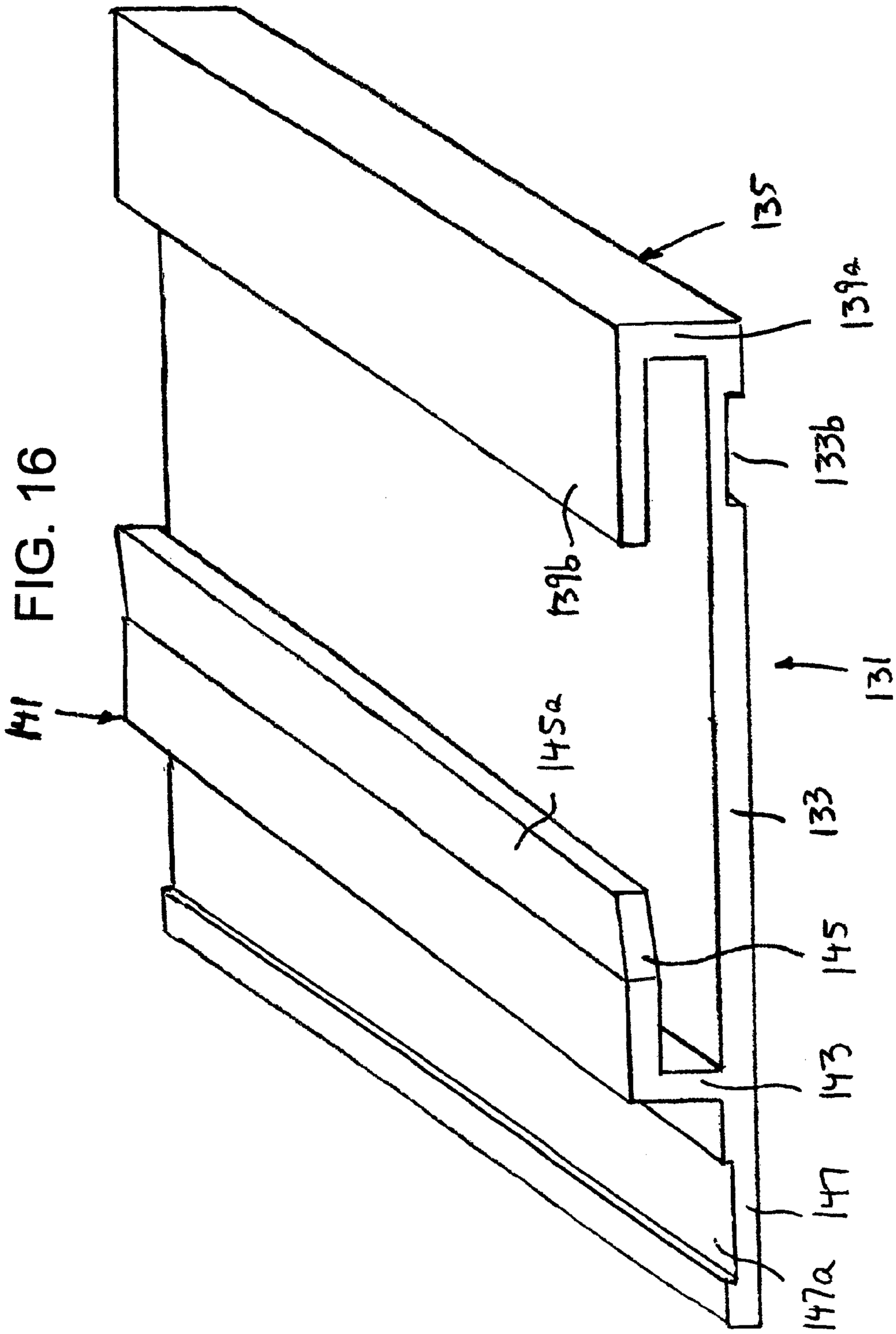
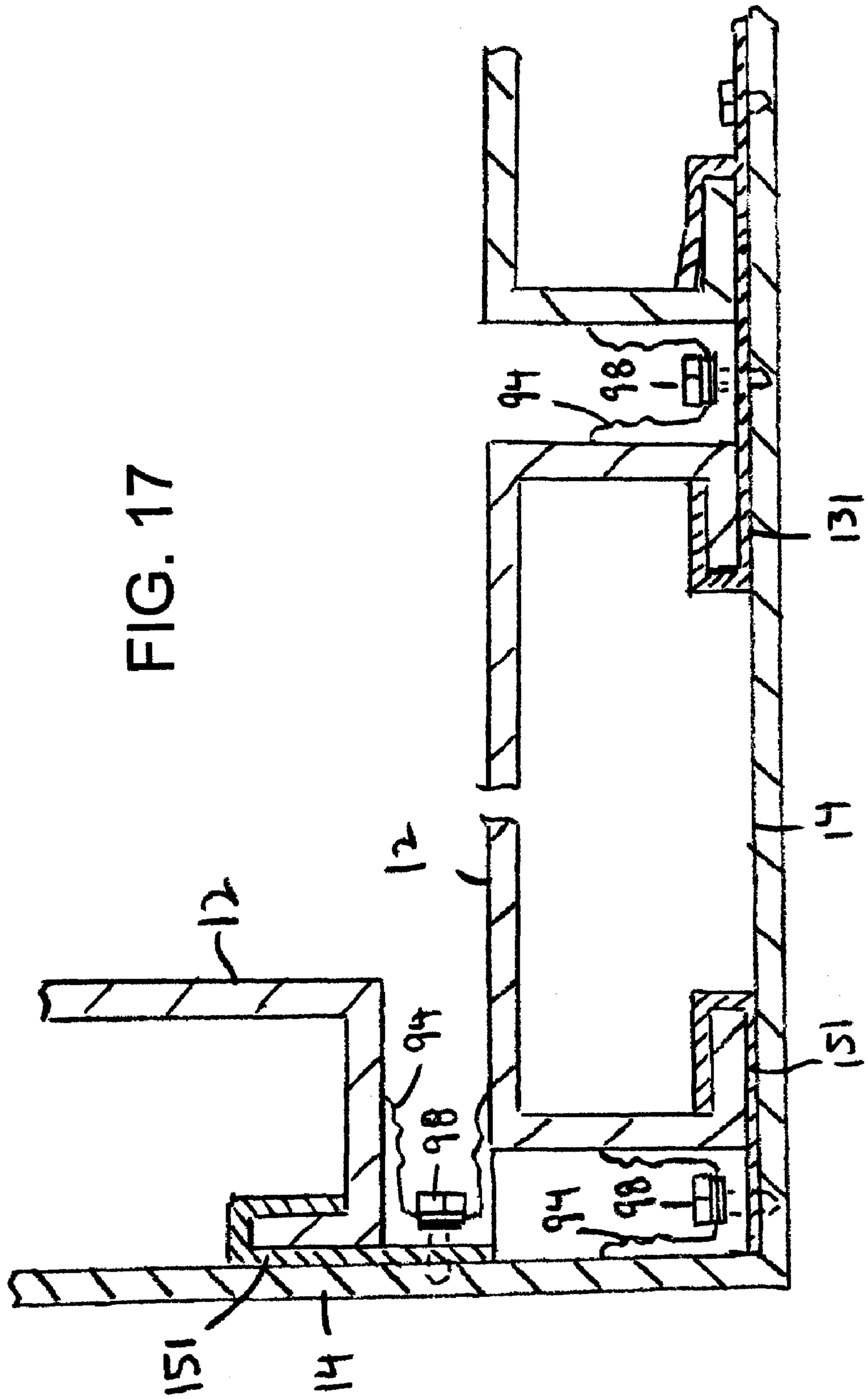


FIG. 16

FIG. 17



SYSTEM FOR MOUNTING WALL PANELS TO A WALL STRUCTURE

REFERENCE TO RELATED APPLICATION

The present application is a Continuation-In-Part of U.S. patent application Ser. No. 11/615,979, filed Dec. 24, 2006 by the same inventor herein and entitled SYSTEM FOR MOUNTING WALL PANELS TO A WALL STRUCTURE, now U.S. Pat. No. 7,472,521.

BACKGROUND OF THE INVENTION

The present invention relates generally to a wall system, and more particularly, to a system for easily mounting wall panels over an existing wall structure.

In order to enhance the look of a wall structure, it is known to secure decorative wall panels to the wall structure. However, the securement of wall panels to the wall structure is generally a long and tedious job since it entails using fastening devices such as nails and/or screws to secure the walls panels directly to the wall structure. In addition, the fastening devices are exposed, which can provide an unsightly appearance.

A system that overcomes some of these problems is sold by Bamco Inc. of 30 Baekeland Ave., Middlesex, N.J. 08846 under the designation "G500 WALL SYSTEM." With this system, the wall panels are provided with right angle or bends at their edges. Each planar panel and the right angle bend together form an L-shape. Each bend is secured by screws to a fastening extrusion having the same linear dimension as the wall panel, and the fastening extrusion having a generally rectangular cross-sectional configuration. At each joint area where two panels meet, there are two such fastening extrusions connected together, each secured to a respective wall panel, with an elongated hard silicone gasket between the fastening extrusions. The fastening extrusions are arranged one above the other at each joint area. Thus, the screws are not visible, thereby eliminating the unsightly appearance of previous system.

However, because of the L-shape at the bends at the edges of the wall panels, it is necessary to separately secure each bend to a fastening extrusion by screws, in addition to securing the fastening extrusions to the wall structure by screws, further increasing the work required to assemble the wall panels. Also, because the bends in the wall panels extend only in a direction perpendicular to the wall panels, the only structural support is provided by the screws which secure each bend to a fastening extrusion. As a result, it is possible to loosen and/or pull out the wall panels.

In addition, in order to secure the fastening extrusions to existing wall structures, one of the connected pair of fastening extrusions is provided with an extension which is separately secured to the existing wall structure. This means that the main bodies of the fastening extrusions are spaced away from the existing wall structure, thereby providing a further weak link in the structure, besides making it more difficult to assemble.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a wall system that overcomes the aforementioned problems.

It is another object of the present invention to provide a wall system which does not require the use of screws to secure the wall panels to the fastening extrusions.

It is still another object of the present invention to provide a wall system in which the wall panels have U-shaped hooks at their edges which are securely held at the fastening extrusions without any screws or other fastening devices.

It is yet another object of the present invention to provide a wall system that is easy to assemble with an existing wall structure.

It is a further object of the present invention to provide a wall system in which the fastening extrusions are secured flush against the existing wall structure by fastening devices, thereby increasing the structural integrity thereof.

It is a still further object of the present invention to provide a wall system that is easy and economical to manufacture and use.

In accordance with an aspect of the present invention, a system for mounting wall panels to an existing wall structure, includes a plurality of wall panels, each wall panel having a main panel section and hook walls at edges of the main panel section, with the main panel section and each hook wall having a U-shaped cross-sectional profile. There are also a plurality of fastening extrusions, each fastening extrusion including a securing section for securing the fastening extrusion to the existing wall structure, a first retaining wall structure near one end of the fastening extrusion and adjacent the securing section, the first retaining wall structure including a recess which receives one hook wall of the wall panel, and a second retaining wall structure near another end of the fastening extrusion, the second retaining wall structure including a recess which receives one hook wall of another wall panel.

The main panel section has a rectangular configuration with four hook walls, and there are four fastening extrusions, with the recess of the retaining wall of each fastening extrusion receiving one hook wall of the wall panel.

Each fastening extrusion includes a planar section having a length, with the first retaining wall structure and the second retaining wall structure extend from a same side of the planar section. The first retaining wall structure is spaced from the one end of the fastening extrusion, and the securing section includes a tail section of the planar section which extends between the one edge and the first retaining wall. Preferably, each retaining wall structure has an L-shaped cross-sectional profile which faces the L-shaped cross-sectional profile of the other retaining wall structure. Also, at least one of the L-shaped cross-sectional profiles can be angled away from the planar section by a small angle. Thus, the planar section and each retaining wall structure together define a U-shaped cross-sectional profile that defines the respective recess.

A corner fastening extrusion is provided for starting assembly at a corner wall. The corner fastening extrusion includes a planar wall section for securing the fastening extrusion to the existing wall structure, and a first retaining wall structure near one end of the planar wall section, the first retaining wall structure including a recess which receives one hook wall of a wall panel. The corner fastening extrusion is used at edges of a respective wall panel corresponding to corners between a side wall and floor, two side walls, and a side wall and a ceiling.

There is also at least one channel secured to the securing sections of adjacent fastening extrusions and positioned between adjacent wall panels corresponding thereto. An elongated plug is inserted into each channel for closing off the channel.

In accordance with another aspect of the present invention, a system for mounting wall panels to an existing wall structure, includes a plurality of wall panels, each wall panel having a main panel section and hook walls at edges of the main panel

main panel section, with the main panel section and each hook wall having a U-shaped cross-sectional profile. A plurality of first fastening extrusion assemblies are provided. Each fastening extrusion assembly includes a securing section for securing the fastening extrusion assembly to the existing wall structure, a first retaining wall structure near one end of the fastening extrusion assembly and adjacent the securing section, the first retaining wall structure including a first recess which receives one hook wall of the wall panel and a second recess, and a second retaining wall structure near another end of the fastening extrusion assembly, the second retaining wall structure including a third recess which receives one hook wall of another wall panel and a fourth recess. A second fastening extrusion assembly is also provided, each second fastening extrusion assembly including a securing section for securing the second fastening extrusion assembly to the existing wall structure, and a first L-shaped retaining wall structure near one end of the fastening extrusion, the first L-shaped retaining wall structure extending into one of the second and fourth recess.

Each of the first fastening extrusion assemblies includes a first fastening extrusion and a second fastening extrusion. A first one of the fastening extrusions includes a tongue and a second one of the fastening extrusions includes a groove for receiving the tongue to connect together the first and second fastening extrusions when the first fastening extrusion is assembled with a first wall panel and the second fastening extrusion is assembled with a second wall panel. A depth of each tongue is greater than a depth of each groove such that each tongue does not fit entirely in the respective groove.

There is also at least one channel secured to the first and second fastening extrusion assemblies and positioned between adjacent wall panels corresponding thereto. An elongated plug is inserted into each channel for closing off the channel.

The main panel section has a rectangular configuration with four hook walls, and there are four first and second fastening extrusion assemblies associated with each main panel section, with the first and third recesses of the first and second retaining walls receiving one hook wall of the wall panel.

There is also a starter extrusion for starting assembly at a corner wall, including a securing section for securing the starter extrusion to the existing wall structure, and a first retaining wall structure connected with the securing section of the starter extrusion and including a fifth recess which receives one hook wall of another wall panel and a sixth recess. There is also a corner fastening extrusion for starting assembly at a corner wall, the corner fastening extrusion including a planar wall section for securing the corner fastening extrusion to the existing wall structure, and a first retaining wall structure at one end of the planar wall section, the first retaining wall structure including an L-shaped retaining wall structure extending into the sixth recess. The starter extrusion and corner fastening extrusion are used at edges of a respective the wall panel corresponding to corners between a side wall and floor, two side walls, and a side wall and a ceiling.

The above and other features of the invention will become readily apparent from the following detailed description thereof which is to be read in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an elevational view of a plurality of wall panels mounted to an existing wall structure;

FIG. **2** is an exploded, rear plan view of a wall panel and four extrusions;

FIG. **3** is an exploded, perspective view, partially in section, showing a wall panel and two extrusions;

FIG. **4** is a vertical cross-sectional view showing a plurality of wall panels secured to an existing wall structure by the extrusions;

FIG. **5** is a perspective view of a U-shaped channel for securing the extrusions to the wall structure;

FIG. **6** is a perspective view of a rubber plug for insertion i the U-shaped channel;

FIG. **7** is a perspective view of a starter extrusion;

FIG. **8** is a vertical cross-sectional view showing the starter extrusion mounting a wall panel adjacent a floor;

FIG. **9** is a horizontal cross-sectional view showing two starter extrusions mounted to two adjacent wall panels at a corner of the wall structure;

FIG. **10** is a perspective view of a corner securing member;

FIG. **11** is a vertical cross-sectional view showing a plurality of wall panels secured to an existing wall structure by the extrusions according to a second embodiment of the present invention;

FIG. **12** is perspective view of a third fastening extrusion according to the second embodiment of the present invention;

FIG. **13** is a perspective view of a fourth corner fastening extrusion according to the second embodiment of the present invention;

FIG. **14** is a horizontal cross-sectional view showing two starter extrusions and two fourth corner fastening extrusion mounted to two adjacent wall panels at a corner of the wall structure according to the second embodiment of the present invention;

FIG. **15** is a vertical cross-sectional view showing a plurality of wall panels secured to an existing wall structure by the extrusions according to a third embodiment of the present invention;

FIG. **16** is perspective view of a modified third fastening extrusion according to the third embodiment of the present invention; and

FIG. **17** is a horizontal cross-sectional view showing two fourth corner fastening extrusion mounted to two adjacent wall panels at a corner of the wall structure according to the third embodiment of the present invention.

DETAILED DESCRIPTION

Referring to the drawings in detail, and initially to FIG. **1-4** thereof, there is shown a system **10** according to a first embodiment of the present invention for easily mounting wall panels **12** over an existing wall structure **14**. Wall structure **14** preferably includes any planar wall. Each panel **12** includes a rectangular shaped, planar main panel section **16** and an L-shaped bend **18** at each edge. As a result, planar panel section **12**, together with L-shaped bend **18**, forms a U-shaped hook structure **20** at each edge. Specifically, each L-shaped bend **18** includes a first right angle panel section **22** at each free side edge of main panel section **16** which extends at a right angle away from main panel section **16**, and a second right angle panel section **24** which extends inwardly at a right angle from the free side edge of first right angle panel section **22** such that each second right angle panel section **24** is positioned behind main panel section **16** in spaced, parallel relation thereto.

Main fastening extrusions **26** are provided for securing each wall panel **12** to existing wall structure **14**. Each main

fastening extrusion **22** includes a first fastening extrusion **28** and a second fastening extrusion **30** secured to first half fastening extrusion **28**.

As shown best in FIGS. **3** and **4**, first fastening extrusion **28** includes an elongated planar section **32** that is positioned flush against existing wall structure **14** with a horizontal orientation. A tongue **34** extends in parallel, coplanar relation along one side edge of elongated planar section **32**, with the thickness of tongue **34** being less than the thickness of planar section **32**. The opposite elongated side edge of planar section **32** includes a recess **36** therein. Recess **36** can extend the entire length of planar section **32**, or alternatively, can be formed only at the ends of planar section **32**. A shallow channel **37** is formed in the outer surface of planar section **32** in alignment with recess **36**.

A U-shaped retaining wall **38** is formed at the opposite side edge of elongated planar section **32**, immediately below recess **36**. Specifically U-shaped retaining wall **38** is defined by planar section **32**, a first right angle retaining wall section **40** at the opposite side edge of elongated planar section **32** and extending at a right angle away from planar section **32**, and a second right angle retaining wall section **42** at the outer free side edge of first right angle retaining wall section **40** and extending at a right angle thereto, such that second right angle retaining wall section **42** is positioned in front of elongated planar section **32** and in spaced, parallel relation thereto. U-shaped retaining wall **32** thereby defines an inwardly directed recess **44** therein for receiving second right angle panel section **24** of hook structure **20** of a respective wall panel **12**.

An L-shaped stabilizing wall **46** is secured to the free side edge of second right angle retaining wall section **42**. L-shaped stabilizing wall **46** includes a first stabilizing wall section **48** secured to the free side edge of second right angle retaining wall section **42** and extending outwardly at a right angle therefrom, and a second stabilizing wall section **50** secured to the free side edge of first stabilizing wall section **48** and extending outwardly at a right angle therefrom, such that each second stabilizing wall section **50** is positioned in parallel, spaced apart relation to second right angle retaining wall section **42**.

In like manner, as shown best in FIGS. **3** and **6**, second fastening extrusion **30** includes an elongated planar section **52** that is positioned flush against existing wall structure **14** with a horizontal orientation. A groove **54** extends in parallel relation along one side edge of elongated planar section **52**, with the opening dimension of groove **54** corresponding to the thickness of tongue **34** in order to receive tongue **34** therein. The opposite elongated side edge of planar section **52** includes a recess **56** therein. Recess **56** can extend the entire length of planar section **52**, or alternatively, can be formed only at the ends of planar section **52**. A shallow channel **57** is formed in the outer surface of planar section **52** in alignment with recess **56**.

A U-shaped retaining wall **58** is formed at the opposite side edge of elongated planar section **52**, immediately below recess **56**. Specifically U-shaped retaining wall **58** is defined by planar section **52**, a first right angle retaining wall section **60** at the opposite side edge of elongated planar section **52** and extending at a right angle away from planar section **52**, and a second right angle retaining wall section **62** at the outer free side edge of first right angle retaining wall section **60** and extending at a right angle thereto, such that second right angle retaining wall section **62** is positioned in front of elongated planar section **52** and in spaced, parallel relation thereto. U-shaped retaining wall **58** thereby defines an inwardly directed recess **64** therein for receiving second right angle panel section **24** of hook structure **20** of a respective wall panel **12**.

An L-shaped stabilizing wall **66** is secured to the free side edge of second right angle retaining wall section **62**. L-shaped stabilizing wall **66** includes a first stabilizing wall section **68** secured to the free side edge of second right angle retaining wall section **62** and extending outwardly at a right angle therefrom, and a second stabilizing wall section **70** secured to the free side edge of first stabilizing wall section **68** and extending outwardly at a right angle therefrom, such that each second stabilizing wall section **70** is positioned in parallel, spaced apart relation to second right angle retaining wall section **62**.

With this arrangement, panels **12** and extrusions **28** and **30** are first assembled in a shop such that two first fastening extrusions **28** and two second fastening extrusions **30** are first secured to each wall panel **12**. Specifically, as shown in FIG. **2**, a first fastening extrusion **28***a* is engaged with a U-shaped hook structure **20***a* at a first edge of a wall panel **12** such that second right angle panel section **24** is engaged within inwardly directed recess **44** and such that L-shaped stabilizing wall **46** is engaged within U-shaped hook structure **20**. Another first fastening extrusion **28***b* is engaged in the same manner with a U-shaped hook structure **20***b* at an adjacent second edge of wall panel **12**. Then, a second fastening extrusion **30***a* is engaged with a U-shaped hook structure **20***c* at a third edge of a wall panel **12** such that second right angle panel section **24** is engaged within inwardly directed recess **64** and such that L-shaped stabilizing wall **66** is engaged within U-shaped hook structure **20***c*. Another second fastening extrusion **30***b* is engaged in the same manner with a U-shaped hook structure **20***d* at an adjacent edge of wall panel **12**. It will be appreciated that the ends of extrusions **28** and **30** are beveled, as shown in FIG. **2**, in order meet in edge to edge contact when assembled with wall panel **12**. However, this is not a requirement of the present invention, and the edges can be square, as shown by the dashed lines in FIG. **2**.

In order to retain extrusions **28***a*, **28***b*, **30***a* and **30***b* assembled with panel **12**, triangular corner plates **71** are inserted in recesses **36** and **56** of adjacent extrusions **28***a*, **28***b*; **28***b*, **30***a*; **30***a*, **30***b*; and **30***b*, **28***a*. A fastening device, such as a screw (not shown) is then screwed through extrusions **28**, **28***b*, **30***a* and **30***b*, and through corner plates **71**, thereby holding the assembly together. It will be appreciated that this is not required for the structural integrity of the system, but is merely provided to enable the panels **12** and extrusions **28** and **30** to be assembled off premises and then transported and assembled at a premises.

In order to start the assembling process, a starter extrusion **72** is provided, as shown in FIGS. **7** and **8**, which is the same as first fastening extrusion **28**, that is, with an elongated planar section **74**, recess **78**, narrow channel **79**, U-shaped retaining wall **80**, first right angle retaining wall section **82**, second right angle retaining wall section **84**, inwardly directed recess **86**, L-shaped stabilizing wall **88**, first stabilizing wall section **90** and second stabilizing wall section **92** corresponding respectively to elongated planar section **32**, recess **36**, narrow channel **37**, U-shaped retaining wall **38**, first right angle retaining wall section **40**, second right angle retaining wall section **42**, inwardly directed recess **44**, L-shaped stabilizing wall **46**, first stabilizing wall section **48** and second stabilizing wall section **50**. However, in place of tongue **34**, starter extrusion **72** includes an extension **76** which is coplanar with elongated planar section **74** and having a narrow channel **77** on one surface thereof and a large open channel **81** on an opposite surface thereof.

As shown in FIG. **7**, which shows a side wall **14***a* and a floor **14***b* of wall structure **14**, starter extrusion **72** is assembled with elongated planar section **74** flush against side wall **14***a* and with the free facing edge of extension **76** flush against floor **14***b*. One or two screws can be screwed through extension **7**.**6** in channel **77** and then into side wall **14***a* to hold starter extension **72** in position. Then, a wall panel **12***a* is assembled with starter extension **72** such that second right angle hook panel section **24** is inserted into inwardly directed recess **86**, first right angle hook panel section **22** is flush against first stabilizing wall section **90** and the rear surface of planar main panel section **16** of wall panel **12***a* is flush against second stabilizing wall section **92**. A U-shaped channel **94** (FIG. **5**) formed by two parallel side walls **94***a* and **94***b*, and a connecting wall **94***c*, is then inserted in the space between floor **14***b* and first right angle hook panel section **22** such that connecting wall **94***c* is flush against extension **76**. Screws can then be screwed through connecting wall **94***c*, extension **76** in channel **77** and then into side wall **14***a* to hold starter extension **72** in position. An elongated rubber plug **96** can then be inserted into channel **94** to provide an aesthetic appearance. In this regard, the inner surfaces of side walls **94***a* and **94***b* can be formed with beads **94***d*, and the outer surfaces of plug **96** can be formed with at least one elongated recess **96***a* for engagement by beads **94***d*.

It will be appreciated that the lowermost panel **12***a* of FIG. **8** has starter extrusion **72** in place of first extrusion **28***a* in the arrangement of FIG. **2**. However, first extrusion **28***b* and second extrusions **30***a* and **30***b* are also assembled at different sides of wall panel **12***a*.

Then, as shown in FIG. **4**, a next wall panel **12***b* is assembled such that first extrusion **28***a* assembled with wall panel **12***b* is connected with second extrusion **30***a* assembled with wall panel **12***a*, that is, with tongue **34** being inserted into groove **54**. U-shaped channel **94** is then inserted in the space between facing outer surfaces of first right angle panel sections **22** of wall panels **12***a* and **12***b*, and is positioned flush against elongated planar section **52** of second fastening extrusion **30***a*. Fastening devices, such as screws **98** are then screwed through connecting walls **94***c*, and elongated planar sections **32** and **52**, including tongues **34**, into side wall **14***a*. Rubber plugs **96** are then inserted into channels **94**.

The same operation occurs at the adjacent sides of each wall panel **16**. This operation continues until the wall panels **12** reach the ceiling (not shown), and the same operation is performed, as was performed at floor **14***b*, by using starter extrusion **72**.

FIG. **9** shows the assembly at the corner of adjacent side walls **14***a* and **14***c*. Specifically, starter extrusions **72** are used for the edges of side panels **12** at the corners. U-shaped channels **94** (not shown in FIG. **9**) are also preferably assembled with starter extrusions **72** in the same manner as previously discussed. In addition, a rubber plug **96** (not shown in FIG. **9**) can be inserted between adjacent corner panels **12**.

It will therefore be appreciated that a novel system **10** for easily mounting wall panels **12** over an existing wall structure **14** has been described which does not require the use of fastening devices to secure wall panels **12** to main fastening extrusions **26** or starter extrusions **72**, and specifically, in which each wall panel **12** has a U-shaped hooked structure **20** at its ends which are securely held at extrusions **26** and **72** without any fastening devices, such as screws or the like. This arrangement prevents wall panels **12** from being pulled out away from existing wall structure **14**. Further, wall system **10** is easy to assemble with an existing wall structure **14** and in which extrusions **14** by fastening devices, thereby increasing the structural integrity thereof. Also, extrusions **28**, **30** and **72** are assembled flush against an existing wall, thereby adding to the structural integrity.

It will be appreciated that various modifications can be made to the present invention within the scope of the claims. For example, second stabilizing wall sections **50** and **70** can be eliminated. As another alternative, channels **94** can be eliminated, and rubber plugs **96** merely inserted in the gap between adjacent wall panels **12**.

With the above arrangement, however, screws **96** must be screwed through connecting walls **94***c*, and elongated planar sections **32** and **52**, including tongues **34**, into side wall **14***a*. In practice, this may be time-consuming and burdensome. Further, in practice, it may become difficult to perfectly align all of the panels together with the fastening extrusions **28** and **30**.

Therefore, referring now to FIGS. **11-14**, there is shown a system **110** according to a second embodiment of the present invention for easily mounting wall panels **12** over an existing wall structure **14**, in which elements corresponding to those of FIGS. **1-10** are identified by the same reference numerals, and a detailed description thereof is not provided, and modified elements corresponding to those of FIGS. **1-10** are identified by the same reference numerals augmented by **100**.

Specifically, first fastening extrusion **128** is modified from first fastening extrusion **28** by deleting first stabilizing wall section **48** and second stabilizing wall section **50**.

The elongated side edge of planar section **132** of first fastening extrusion **128** opposite tongue **134** includes a recess **136** therein. Recess **136** can extend the entire length of planar section **132**, or alternatively, can be formed only at the ends of planar section **132**. A shallow channel **137** is formed in the outer surface of planar section **132** in alignment with recess **136**.

A U-shaped retaining wall **138** is formed at the same side edge of elongated planar section **132** as recess **136**. Specifically U-shaped retaining wall **138** is defined by planar section **132**, a first right angle retaining wall section **140** at the opposite side edge of elongated planar section **132** and extending at a right angle away from planar section **132**, and a second right angle retaining wall section **142** at the outer free side edge of first right angle retaining wall section **140** and extending at a right angle thereto, such that second right angle retaining wall section **142** is positioned in front of elongated planar section **132** and in spaced, parallel relation thereto. U-shaped retaining wall **138** thereby defines an inwardly directed recess **144** therein for receiving second right angle panel section **24** of hook structure **20** of a respective wall panel **12**.

Second fastening extrusion **130** is modified from first fastening extrusion **30** by deleting first stabilizing wall section **68** and second stabilizing wall section **70**, and by shortening elongated planar section **152**, thereby reducing the depth dimension of groove **154** therein. In this regard, only a distal portion of tongue **134** of first fastening extrusion **128** extends into groove **154**. As a result of this construction, and as shown in FIG. **11**, screw **98** does not extend through elongated planar section **152** of second fastening extrusion **130**, making assembly much easier. This is because there are dead or open space areas **183** on opposite sides of tongue **134** to which elongated planar section **152** does not extend.

As with the first embodiment, the opposite elongated side edge of planar section **152** includes a recess **156** therein. Recess **156** can extend the entire length of planar section **152**, or alternatively, can be formed only at the ends of planar section **152**. A shallow channel **157** is formed in the outer surface of planar section **152** in alignment with recess **156**.

Second fastening extrusion **130** also includes, as with the first embodiment, a U-shaped retaining wall **158** formed at the same side edge of elongated planar section **152** as recess **156**. Specifically U-shaped retaining wall **158** is defined by planar section **152**, a first right angle retaining wall section **160** at the opposite side edge of elongated planar section **152** and extending at a right angle away from planar section **152**, and a second right angle retaining wall section **162** at the outer free side edge of first right angle retaining wall section **160** and extending at a right angle thereto, such that second right angle retaining wall section **162** is positioned in front of elongated planar section **152** and in spaced, parallel relation thereto. U-shaped retaining wall **158** thereby defines an inwardly directed recess **164** therein for receiving second right angle panel section **24** of hook structure **20** of a respective wall panel **12**.

In order to further increase stability while making assembly of the panels **12** easier, and in accordance with another aspect of the present invention, a third fastening extrusion **131**, as shown best in FIGS. **11** and **12**, is assembled therewith. Third fastening extrusion **131** includes an elongated planar section **133** having a first inwardly directed L-shaped engagement wall **135** at one edge thereof, with a first wall section **139***a* extending perpendicular from the edge of elongated planar section **133** and a second wall section **139***b* connected to the free edge of first wall section **139***a* and extending perpendicular thereto so as to extend in parallel spaced apart relation from elongated planar section **133**. The opposite end of elongated planar section includes a channel **133***a* defining a reduced thickness section. The underside of planar section **133** has a recess **133***b* immediately below second wall section **139***b* and the opposite surface of planar section **133** includes a further recess **133***c* adjacent thereto.

In addition, a fourth corner fastening extrusion **151**, as shown best in FIGS. **13** and **14**, includes an elongated planar section **153** having a first inwardly directed L-shaped engagement wall **155** at one edge thereof, with a first wall section **159***a* extending perpendicular from the edge of elongated planar section **153** and a second wall section **159***b* connected to the free edge of first wall section **159***a* and extending perpendicular thereto so as to extend in parallel spaced apart relation from elongated planar section **153**. Elongated planar section **153**, at a position spaced from the free edge of second wall section **159***b*, has a recess or channel **153***a* therein in order to reduce the thickness thereof. It will be appreciated that the length of elongated planar section **153** is much less than that of elongated planar section **133**. The underside of planar section **153** has a recess **153***b* immediately below second wall section **159***b*.

In order to assemble the panels **12**, a person starts from the floor **14***b* and works up side wall **14***a*, as shown in FIG. **11**. Specifically, a fourth corner fastening extrusion **151** is preassembled with a starter extrusion **172** by inserting second wall section **159***b* into recess **178** thereof. It will be appreciated that starter extrusion **172** is identical to starter extrusion **72**, except that first stabilizing wall section **90** and second stabilizing wall section **92** are eliminated. The opposite edges of fourth corner fastening extrusion **151** and starter extrusion **72** are then placed flush against floor **14***b*, and screws (not shown) are inserted through both pieces into side wall **14***a*. Thereafter, U-shaped hook structure **20** of wall panel **12***c* is inserted into inwardly directed recess **186** of starter extrusion **172**. A U-shaped channel **94** is also placed against floor **14***b* and screws **98** are inserted through all three pieces into side wall **14***a*. A plug **96** is then inserted into U-shaped channel **94**.

The U-shaped hook structure **20** at the opposite upper side of wall panel **12***c* has been preassembled with first fastening extrusion **128** and third fastening extrusion **131**, with second wall section **139***b* being inserted into recess **136** and with U-shaped hook structure **20** being inserted into inwardly directed recess **144**. Screws (not shown) which extend through recess **133***b*, shallow channel **137** of first fastening extrusion **128** and U-shaped hook structure **20**, hold these elements together. In this position, the free end of the pre-assembled third fastening extrusion **131**, in channel **133***a* thereof, is screwed into side wall **14***a* by screws **199** along the entire length thereof. Then, second fastening extrusion **130**, which is pre-assembled with the lower U-shaped hook structure **20** of another wall panel **12***b* by screws (not shown) extending through shallow channel **157**, is assembled with first fastening extrusion **128** by tongue **134** and groove **154**. The U-shaped hook structure **20** at the opposite upper side of wall panel **12***b* has been preassembled with a first fastening extrusion **128** and third fastening extrusion **131** in the manner described above with panel **12***c*. In this position, the free end of the pre-assembled third fastening extrusion **131**, in channel **133***a* thereof, is screwed into side wall **14***a* by screws **199** along the entire length thereof. Then, a U-shaped channel **94** is held between the adjacent hook structures **20** of panels **12***b* and **12***c* by screws **98** which are screwed through tongue **134**, recess **133***c* of planar section **133** of third fastening extrusion **131** and then into wall **14***a*. An elongated rubber plug **96** is then inserted into each channel **94** to provide an aesthetic appearance.

This assembly process continues until the top of wall **14***a* is reached, wherein another starter extrusion **172** is assembled thereat. This process also continues in the same way in a sidewards direction of each panel **12** until the entire wall structure is assembled.

It will be appreciated that first fastening extrusion **128** and second fastening extrusion **130** of the second embodiment can be eliminated at each juncture of panels **12**, as shown by the modified third embodiment of the present invention of FIGS. **15-17**.

As shown in FIGS. **15** and **16**, third fastening extrusion **131** is modified to further include a second inwardly directed L-shaped engagement wall **141** which extends from the same side as elongated planar section **133** as L-shaped engagement wall **135**, and is in facing relation to first inwardly directed L-shaped engagement wall **135**. Specifically, second inwardly directed L-shaped engagement wall **141** includes a first wall section **143** extending perpendicular from elongated planar section **133** at a position spaced about one-quarter of the length of second inwardly directed L-shaped engagement wall **141**, measured from the opposite edge thereof, although the present invention is not limited to these dimensions, and a second wall section **145** connected to the free edge of first wall section **143** and extending perpendicular thereto so as to extend in parallel spaced apart relation from elongated planar section **133**. The heights of first wall sections **139***a* and **143** are the same so that second wall sections **139***b* and **145** are coplanar. With this arrangement, elongated planar section **133** forms a tail wall section **147** to the outside of second inwardly directed L-shaped engagement wall **141**. Tail wall section **147** has a recess **147***a* extending therealong in order to reduce the thickness thereof. Preferably, a distal portion of wall **145** is angled slightly away from planar section **133**.

In this regard, as shown in FIG. **15**, the edge of fourth corner fastening extrusion **151** is placed flush against the ceiling **14***c*, and is screwed into side wall **14***a* by screws (not shown) along the entire length thereof at the end thereof adjacent ceiling **14***b* and within recess **153***a*. Thereafter, a U-shaped hook structure **20** of a wall panel **12***d* is inserted into the inwardly directed recess defined by first inwardly

directed L-shaped engagement wall **155** of fourth corner fastening extrusion **151**. To assist in such insertion, a portion of wall **159***b* thereof can be angled slightly away from planar section **153**. Alternatively, U-shaped hook structure **20** can be pre-assembled with fourth corner fastening extrusion **151** by screws (not shown). Then, a U-shaped channel **94** is placed against ceiling **14***c* and screws **98** are inserted through connecting wall **94***c* of U-shaped channel **94** and through fourth corner fastening extrusion **151** into side wall **14***a*. An elongated rubber plug **96** can then be inserted into each channel **94** to provide an aesthetic appearance.

The U-shaped hook structure **20** at the opposite lower side of the wall panel **12***d* has been preassembled with L-shaped engagement wall **135** of a third fastening extrusion **131**. Therefore, when this panel **12** is hung from fourth corner fastening extrusion **151**, tail section **147** of the pre-assembled third fastening extrusion **131** is screwed into side wall **14***a* by screws **199** along the entire length thereof. Then, U-shaped hook structure **20** of another wall panel **12***e* is inserted into the inwardly directed recess defined by second inwardly directed L-shaped engagement wall **141** of third fastening extrusion **131**. To assist in such insertion, a portion **145***a* of second wall section **145** thereof can be angled slightly away from planar section **133**, as shown best in FIGS. **15** and **16**. This assembly process continues until the bottom of wall **14***a* is reached, wherein another fourth corner fastening extrusion **151** is assembled thereat. This process also continues in the same way in a sidewards direction of each panel **12** until the entire wall structure is assembled. At each juncture of panels **12**, a U-shaped channel **94** is held between the adjacent hook structures **20** by screws **98** which are screwed through planar section **133** of third fastening extrusion **131** and then into wall **14***a*. An elongated rubber plug **96** can then be inserted into each channel **94** to provide an aesthetic appearance.

Of course, it will be appreciated that triangular corner plates **71** are still used with the second and third embodiments in the same manner as the first embodiment.

It will be appreciated that various modifications can be made to the present invention within the scope of the claims. For example, fourth corner fastening extrusion **151** can be formed from third fastening extrusion **131** by forming the latter with a weakened line therealong to be effectively snapped or cut in half, leaving a portion of planar section **133** and first inwardly directed L-shaped engagement wall **135** forming fourth corner fastening extrusion **151**.

Having described specific preferred embodiments of the invention with reference to the accompanying drawings, it will be appreciated that the present invention is not limited to those precise embodiments and that various changes and modifications can be effected therein by one of ordinary skill in the art without departing from the scope or spirit of the invention as defined by the appended claims.

What is claimed is:

1. A system for mounting wall panels to an existing wall structure, comprising:

a plurality of wall panels, each wall panel having a main panel section and L-shaped hook walls at edges of the main panel section, each L-shaped hook wall including a first right angle panel section at each free side edge of the main panel section which extends at a right angle away from the main panel section, and a second right angle panel section which extends inwardly at a right angle from a free side edge of the first right angle panel section such that each second right angle panel section is positioned behind the main panel section in spaced, parallel relation thereto, with the main panel section and each L-shaped hook wall together defining a U-shaped cross-sectional profile;

a plurality of unitary, single piece fastening extrusions, each fastening extrusion including:

a planar section having a length,

a first retaining wall structure near one end of the fastening extrusion and adjacent the securing section, the first retaining wall structure including a recess which opens in a first direction and receives one said hook wall of said wall panel, said first retaining wall structure being spaced from said one end of said fastening extrusion,

a second retaining wall structure near another end of the fastening extrusion, the second retaining wall structure including a recess which opens in a second direction opposite to said first direction and receives one said hook wall of another said wall panel,

said first retaining wall structure and said second retaining wall structure extend from a same side of said planar section,

a first securing section for securing the fastening extrusion to the existing wall structure, said first securing section including a tail section of said planar section which extends between said one edge and said first retaining wall, and

a second securing section for securing the fastening extrusion to the existing wall structure, said second securing section including part of said planar section positioned between said first and second retaining walls; and

a closure member secured to the second securing section of each fastening extrusion and positioned between adjacent wall panels corresponding thereto.

2. A system according to claim **1**, wherein said main panel section has a rectangular configuration with four said hook walls, with the recess of the retaining wall of each fastening extrusion receiving one said hook wall of said wall panel.

3. A system according to claim **1**, wherein each retaining wall structure has an L-shaped cross-sectional profile which faces the L-shaped cross-sectional profile of the other retaining wall structure.

4. A system according to claim **3**, wherein at least one of said L-shaped cross-sectional profiles is angled away from said planar section by a small angle.

5. A system according to claim **1**, wherein said planar section and each said retaining wall structure together define a U-shaped cross-sectional profile that defines the respective said recess.

6. A system according to claim **1**, further including a corner fastening extrusion for starting assembly at a corner wall, the corner fastening extrusion including:

a planar wall section for securing the fastening extrusion to the existing wall structure, and

a first retaining wall structure near one end of the planar wall section, the first retaining wall structure including a recess which receives one hook wall of a wall panel.

7. A system according to claim **6**, wherein the corner fastening extrusion is used at edges of a respective said wall panel corresponding to corners between:

a side wall and floor,

two side walls, and

a side wall and a ceiling.

8. A system according to claim **1**, wherein the closure member includes at least one channel secured to the second securing section of each fastening extrusion and positioned between adjacent wall panels corresponding thereto.

9. A system according to claim 8, further comprising an elongated plug inserted into each channel for closing off the channel.

10. A system for mounting wall panels to an existing wall structure, comprising:

a plurality of wall panels, each wall panel having a main panel section and hook walls at edges of the main panel section, with the main panel section and each hook wall together defining a U-shaped cross-sectional profile;

a plurality of first fastening extrusion assemblies, each fastening extrusion assembly including:

a securing section for securing the fastening extrusion assembly to the existing wall structure,

a first retaining wall structure near one end of the fastening extrusion assembly and adjacent the securing section, the first retaining wall structure including a first recess which receives one said hook wall of said wall panel and a second recess, and

a second retaining wall structure near another end of the fastening extrusion assembly, the second retaining wall structure including a third recess which receives one said hook wall of another said wall panel and a fourth recess; and

a second fastening extrusion assembly, each second fastening extrusion assembly including:

a securing section for securing the second fastening extrusion assembly to the existing wall structure,

a first L-shaped retaining wall structure near one end of the fastening extrusion, the first L-shaped retaining wall structure extending into one of the second and fourth recess.

11. A system according to claim 10, wherein each of said first fastening extrusion assemblies includes a first fastening extrusion and a second fastening extrusion, a first one of said fastening extrusions includes a tongue and a second one of said fastening extrusions includes a groove for receiving said tongue to connect together said first and second fastening extrusions when said first fastening extrusion is assembled with a first wall panel and said second fastening extrusion is assembled with a second wall panel.

12. A system according to claim 11, wherein a depth of each tongue is greater than a depth of each groove such that each tongue does not fit entirely in the respective groove.

13. A system according to claim 10, further comprising at least one channel secured to the first and second fastening extrusion assemblies and positioned between adjacent wall panels corresponding thereto.

14. A system according to claim 13, further comprising an elongated plug inserted into each channel for closing off the channel.

15. A system according to claim 10, wherein said main panel section has a rectangular configuration with four said hook walls, and there are four said first and second fastening extrusion assemblies associated with each main panel section, with the first and third recesses of the first and second retaining walls receiving one said hook wall of said wall panel.

16. A system according to claim 10, further comprising:

a starter extrusion for starting assembly at a corner wall, comprising:

a securing section for securing the starter extrusion to the existing wall structure, and

a first retaining wall structure connected with the securing section of the starter extrusion and including a fifth recess which receives one said hook wall of another said wall panel and a sixth recess, and

a corner fastening extrusion for starting assembly at a corner wall, the corner fastening extrusion including:

a planar wall section for securing the corner fastening extrusion to the existing wall structure, and

a first retaining wall structure at one end of the planar wall section, the first retaining wall structure including an L-shaped retaining wall structure extending into the sixth recess.

17. A system according to claim 16, wherein the starter extrusion and corner fastening extrusion are used at edges of a respective said wall panel corresponding to corners between:

a side wall and floor,

two side walls, and

a side wall and a ceiling.

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